

Artificial intelligence adoption and financial management outcomes: A multi-dimensional analysis of banking and insurance sectors in Indonesia

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Abstract

This study investigates the impact of Artificial Intelligence (AI) adoption on the financial performance of banking and insurance firms listed on the Indonesia Stock Exchange from 2020 to 2024. Using a quantitative explanatory framework, the research analyzes a sample of 230 observations. AI adoption was measured through disclosure intensity in annual reports, while financial performance was evaluated across three dimensions: operational efficiency (BOPO), financial stability (Z-Score), and firm value (Tobin's Q). A Fixed Effect Model was employed for statistical analysis, as dictated by the Hausman Test results. The results indicate that AI adoption has a significant positive impact on operational expenses (BOPO), suggesting that high infrastructure costs and initial implementation expenditures currently outweigh efficiency gains. However, AI adoption also shows a significant positive impact on firm value, supporting Signaling Theory, where investors reward digital transformation despite short-term costs. No significant impact was found on financial stability. These findings confirm an AI Productivity Paradox in the Indonesian emerging market, where the high cost of implementation creates a temporary financial burden but yields a market innovation premium.

Keywords: Artificial Intelligence, Financial Performance, Indonesia Stock Exchange, Signaling Theory, Operational Efficiency.

Abstrak

Penelitian ini menyelidiki dampak adopsi Kecerdasan Buatan (AI) terhadap kinerja keuangan perusahaan perbankan dan asuransi yang terdaftar di Bursa Efek Indonesia dari tahun 2020 hingga 2024. Menggunakan kerangka kerja eksplanatori kuantitatif, penelitian ini menganalisis sampel sebanyak 230 observasi. Adopsi AI diukur melalui intensitas pengungkapan dalam laporan tahunan, sementara kinerja keuangan dievaluasi melalui tiga dimensi: efisiensi operasional (BOPO), stabilitas keuangan (Z-Score), dan nilai perusahaan (Tobin's Q). Fixed Effect Model digunakan untuk analisis statistik, sesuai dengan hasil Uji Hausman. Hasil penelitian menunjukkan bahwa adopsi AI memiliki dampak positif signifikan terhadap beban operasional (BOPO), yang menunjukkan bahwa biaya infrastruktur yang tinggi dan pengeluaran implementasi awal saat ini melampaui keuntungan efisiensi. Namun, adopsi AI juga menunjukkan dampak positif signifikan terhadap nilai perusahaan, mendukung Teori Sinyal, di mana investor mengapresiasi transformasi digital meskipun terdapat biaya jangka pendek. Tidak ditemukan dampak signifikan terhadap stabilitas keuangan. Temuan ini mengonfirmasi adanya Paradoks Produktivitas AI di pasar berkembang Indonesia, di mana biaya implementasi yang tinggi menciptakan beban keuangan sementara namun menghasilkan premi inovasi pasar.

Kata kunci: Kecerdasan Buatan, Kinerja Keuangan, Bursa Efek Indonesia, Teori Sinyal, Efisiensi Operasional.

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1. Introduction

The Indonesian financial sector is currently navigating a profound "technological renaissance," a shift fundamentally driven by the strategic mandates of the "Blueprint for Digital Banking Transformation" (Agustiawan, 2024). As digital disruption reshapes the industry, publicly listed firms on the Indonesia Stock Exchange (IDX) are increasingly adopting Artificial Intelligence (AI) to optimize complex operations, manage systemic risks, and secure a sustainable competitive advantage (Binsar et al., 2026; Judijanto et al., 2024). This transition represents a pivot from traditional manual processing to an automated, data-driven ecosystem where speed and precision define market leadership. However, despite this momentum, a significant research gap persists regarding how this transformation translates into multi-dimensional performance within emerging markets (Lolo et al., 2026).

While global expenditure on AI infrastructure is projected to double in the coming years, standardized frameworks for its practical and ethical implementation remain scarce, leaving many firms to navigate this transition without a clear empirical roadmap (Vuković et al., 2025). Recent industry data reveals that AI adoption in Indonesia has reached a notable 24.6% and continues to rise, effectively placing the nation among the digital leaders within the ASEAN region (Saputra et al., 2023). Despite this rapid growth in practice, the corresponding academic evidence remains heavily biased toward developed economies, which operate under different regulatory and market maturity levels (Lolo et al., 2026). This geographical imbalance suggests that findings from the West may not be directly applicable to the unique institutional environment of the IDX.

A critical limitation of current literature is its tendency to explore AI in isolation, often focusing solely on singular metrics such as operational efficiency (Agustiawan, 2024) or accounting-based performance (Mardanov et al., 2026). These "siloes" approaches rarely integrate critical factors like market value, financial stability, and efficiency within a single, cohesive framework, a multi-dimensional methodology pioneered by recent scholars like (Hamdouni, 2025). By failing to look at the "big picture," existing research may overlook the trade-offs between short-term cost-cutting and long-term market signaling. Furthermore, while the banking industry is a frequent subject of academic scrutiny, the insurance sector on the IDX remains an underserved area that requires deeper exploration to understand the full scope of financial innovation (Abongo, 2025).

This study addresses these identified gaps by utilizing a robust panel dataset spanning 2020 to 2024, a period marked by intense digital acceleration. The research design rigorously controls for Firm Size (Z) to ensure that the observed results reflect true technological impact rather than mere institutional scale or the advantages inherent to massive asset bases (Lolo et al., 2026; Oldemeyer et al., 2025). Through this approach, the study aims to provide a holistic evaluation of AI's transformative role, offering a more nuanced understanding of how Indonesian financial firms can balance operational growth with market expectations in an increasingly volatile digital economy.

2. Literature Review

Artificial Intelligence and AI Adoption

This study is grounded in a robust theoretical triangulation involving the Resource-Based View (RBV), Signaling Theory, and the Technology-Organization-Environment (TOE) framework. The RBV perspective posits that AI serves as a unique, non-substitutable, and valuable organizational resource that generates a sustainable competitive advantage and leads to superior financial outcomes (Hamdouni, 2025; ul Haq et al., 2025). According to this view, the "intelligence" embedded in firm processes acts as an intangible asset that competitors cannot easily replicate. Simultaneously, suggests that the public disclosure of AI adoption provides a positive market signal to investors, thereby enhancing firm value and market capitalization even before the tangible accounting benefits are fully realized in the balance sheet (Basnet et al., 2025)

To further explain the complexities of adoption, the identifies how technological infrastructure, organizational maturity, and environmental turbulence such as rapid regulatory shifts collectively influence the intensity of AI adoption (Lolo et al., 2026; Yuniawan et al., 2025). Complementing these pillars, suggests that AI adoption enables firms to continuously reconfigure their internal processes to maintain high performance during periods of market volatility (Ayoub & Sopuru, 2026). This integration of theories allows the study to account for both the internal resources required for AI and the external pressures that drive firms to disclose their technological progress to the public.

Throughout this integrated theoretical framework, Firm Size (Z) is identified as a critical determinant of a firm's resource acquisition capacity and the subsequent credibility of its market signals (Ayinaddis, 2025; Lolo et al., 2026). Larger firms typically have the financial slack necessary to invest in high-order AI systems, while their size also ensures that their disclosures are more visible to market analysts and investors. By accounting for size, the framework ensures that the relationship between AI adoption and performance is evaluated fairly across the diverse landscape of the IDX, which includes both massive banking conglomerates and smaller, specialized insurance entities.

Moreover, the framework acknowledges that AI's capability to automate complex processes and identify deep patterns can enhance the precision, comprehensiveness, and timeliness of financial reporting, thereby supporting the decision-making of both internal and external stakeholders (Ayoub & Sopuru, 2026; Basnet et al., 2025). This improved reporting quality acts as a mechanism to mitigate information asymmetry and agency costs, thus contributing to enhanced market efficiency and investor confidence. Specifically, the integration of AI can facilitate advanced data analytics and adherence to Shariah principles within Islamic banking, highlighting the broader applicability of these technologies across diverse financial sub-sectors and religious ethical frameworks (Amelia et al., 2025). Through this multi-faceted theoretical lens, the study provides a comprehensive basis for analyzing AI's impact on the multifaceted financial performance of Indonesian firms.

Financial Performance

Financial performance is a subjective measure of how well a firm uses assets from its primary mode of business and generates revenues (Hamdouni, 2025; Lolo et al., 2026). It serves as a general measure of a firm's overall financial health over a given period (Hamdouni, 2025). In the modern digital era, financial performance is no longer viewed solely through net profit but also through the lens of long-term sustainability and market competitiveness (Alshareef, 2025; Binsar et al., 2026; Hamdouni, 2025).

Multi-Dimensional Financial Performance

This research adopts a Multi-Dimensional perspective, moving beyond traditional singular metrics to capture the full scope of digital transformation (Hamdouni, 2025; Lolo et al., 2026). This approach acknowledges that technology influences a firm in various ways across different functional domains (Binsar et al., 2026; Hamdouni, 2025):

- 1) **Internal-Operational:** Operational performance is measured by the firm's ability to control costs relative to its income, primarily through efficiency metrics like the BOPO ratio. AI adoption facilitates process automation and high-speed data processing, allowing financial institutions to streamline complex back-office workflows. These technological advancements are expected to lower operating expenses and significantly improve the overall efficiency ratio (Agustiawan, 2024; Mardanov et al., 2026; Yu et al., 2026).
- 2) **Risk-Based:** Risk-based performance is measured by the firm's distance from insolvency and its long-term structural resilience against financial shocks. AI-driven risk management and advanced analytics enhance a firm's ability to detect fraud and manage credit volatility through real-time monitoring. The implementation of these digital tools leads to more precise risk assessment, thereby increasing the firm's overall financial stability (Aldasoro et al., 2025; Hamdouni, 2025; Harmelani & Cahyaningtyas, 2024).
- 3) **External-Market:** External-market performance is measured by investor perception and the resulting market valuation, typically represented by Tobin's Q. Based on signaling theory, disclosures of AI adoption provide a positive signal to the market regarding the firm's future growth potential and digital readiness. This strategic communication is expected to be reflected in higher valuation multiples as investors reward the institution's commitment to innovation (Alshareef, 2025; Hamdouni, 2025; Koulis et al., 2025).

AI Adoption and Operational Efficiency

The implementation of Artificial Intelligence in credit scoring and customer analytics is strategically designed to reduce manual overhead and enhance operational precision. According to the Resource-Based View (RBV), AI serves as a unique technological asset that enables financial institutions to streamline labor-intensive processes and optimize resource allocation (Agustiawan, 2024; Kadam et al., 2025). While initial infrastructure costs are substantial, empirical evidence suggests that firms leveraging these tools effectively can achieve significant economies of scale, thereby lowering their operational expense ratios over time (Lolo et al., 2026; Mardanov et al., 2026). Furthermore, AI-driven automation minimizes human error in transaction processing

and back-office functions, which directly contributes to long-term cost containment and improved service delivery (Binsar et al., 2026; Ngabalin, 2025). In the context of the Indonesian banking and insurance sectors, this digital shift is expected to improve the BOPO ratio by maximizing output per unit of labor and capital. Consequently, technology-driven efficiency becomes a primary driver of competitive advantage in a rapidly evolving and highly competitive financial landscape.

H1: AI Adoption has a positive effect on Operational Efficiency.

AI Adoption and Financial Stability

AI-driven risk management frameworks significantly enhance the quality and speed of risk assessments within the financial services industry. By utilizing advanced predictive analytics, banking and insurance firms can identify potential defaults and fraudulent activities with greater accuracy than traditional manual methods (Aldasoro et al., 2025). This technological capability reduces earnings volatility and strengthens the capital buffer, which is essential for maintaining high Z-score levels and overall institutional solvency (Hamdouni, 2025; Han et al., 2026). Larger firms, in particular, often possess the necessary capital stability and technological maturity to absorb the initial risks and implementation challenges associated with deep digital transformation (Basnet et al., 2025; Lolo et al., 2026). Moreover, the integration of AI in asset-liability management allows for more dynamic responses to market shifts, thereby mitigating exposure to both systemic and idiosyncratic risks (Vuković et al., 2025). As AI systems continuously learn from vast datasets, the precision of risk pricing and monitoring improves, fostering a more resilient financial structure capable of withstanding economic disruptions.

H2: AI Adoption has a positive effect on Financial Stability.

AI Adoption and Firm Value

Rooted in Signaling Theory, the disclosure of AI adoption acts as a powerful indicator to external stakeholders regarding a firm's future growth potential and innovative capacity. Investors typically perceive the integration of cutting-edge technology as a signal of superior management quality and a commitment to future profitability, which leads to a higher market valuation reflected in Tobin's Q (Alshareef, 2025; Hamdouni, 2025). This "innovation premium" is particularly evident in emerging markets like Indonesia, where digital maturity is increasingly used by shareholders to differentiate high-performing, forward-looking firms from traditional competitors (Akour et al., 2024; Alamsyah et al., 2025; Koulis et al., 2025; Rohan et al., 2026). Firm size serves as a critical contextual factor in this relationship, as institutional scale often dictates the visibility and credibility of these technological signals in the broader capital market (Lolo et al., 2026). Furthermore, the transparent reporting of AI initiatives helps reduce information asymmetry between the firm and its investors, fostering more favorable market sentiment and reducing the cost of capital (Basnet et al., 2025). Therefore, the strategic adoption and public disclosure of AI are expected to drive a significant and measurable upward trajectory in overall firm value.

H3: AI Adoption has a positive effect on Firm Value.

3. Research Method

The research sample encompasses a longitudinal dataset from the IDX spanning 2020 to 2024. The final dataset includes $N = 230$ observations from audited annual reports of banking and insurance firms (Binsar et al., 2026). AI Adoption Intensity (X_1) is quantified using textual analysis of AI-related keywords, transformed via $\ln(X+1)$ to handle zero-value observations and skewness (Lolo et al., 2026; Yang & Yang, 2025). Firm Size (Z) is calculated using $\ln(\text{Total Assets})$ (Harmelani & Cahyaningtyas, 2024). Dependent variables include Operational Efficiency (Y_1 : BOPO), Financial Stability (Y_2 : Z-score), and Firm Value (Y_3 : Tobin's Q).

AI Adoption Intensity is measured by the depth of AI integration based on the frequency of specific keywords (e.g., "Artificial Intelligence," "Machine Learning," "Algorithm," "Big Data") found in the annual reports. To normalize the data and accommodate firms with zero disclosures, it is calculated as the natural logarithm of the total keywords plus one, $\ln(X+1)$. This textual analysis approach aligns with recent studies examining corporate AI narratives and disclosure quality, emphasizing that audited annual reports serve as a critical and reliable instrument for evaluating a firm's strategic transparency and information quality (Alshareef, 2025; Basnet et al., 2025; Tagal et al., 2025):

$$AI_Intensity = \ln(\text{Total AI Keywords} + 1)$$

Operational Efficiency (BOPO) is defined as the ratio of operating expenses to operating income, this metric assesses the firm's ability to manage its core activities efficiently. In the Indonesian banking context, this ratio is a critical indicator of how digital transformation and automation impact the cost structure (Agustiawan, 2024; Harmelani & Cahyaningtyas, 2024). It is expressed as:

$$BOPO = \frac{\text{Total Operating Expenses}}{\text{Total Operating Income}} \times 100\%$$

Financial Stability (Z-score) reflects the firm's distance to default, where a higher score indicates greater structural resilience and a lower probability of insolvency. This measurement is widely used to evaluate the impact of financial technology on institutional stability (Aldasoro et al., 2025; Hamdouni, 2025). The formula used for financial institutions is:

$$Z - Score = \frac{ROA + (\text{Equity}/\text{Total Assets})}{\sigma(ROA)}$$

Where ROA is Return on Assets and $\sigma(ROA)$ is the standard deviation of ROA over the study period.

Firm Value measures market performance relative to the replacement cost of assets, capturing investor perceptions of the firm's future growth potential driven by technological innovation. High valuation multiples often reflect market confidence in a firm's AI-enabled strategic capabilities (Koulis et al., 2025; Moro-Visconti et al., 2023). It is calculated as:

$$\text{Tobin's } Q = \frac{(\text{Closing Price} \times \text{Shares Outstanding}) + \text{Total Liabilities}}{\text{Total Assets}}$$

Firm Size is utilized as a control variable to mitigate the effect of institutional scale on financial outcomes, firm size accounts for the differences in resources available for AI implementation. It is operationalized as the natural logarithm of total assets to reduce data variance and ensure a more normal distribution (Oldemeyer et al., 2025; Yang & Yang, 2025).

$$\text{Firm Size} = \ln(\text{Total Assets})$$

To determine the most appropriate panel data estimation method, this study conducted a series of rigorous diagnostic tests, including the Chow test, the Lagrange Multiplier (LM) test, and the Hausman test. While the Common Effect Model (CEM) was initially considered, the results of the Chow test ($p < 0.05$) and the Hausman test ($p < 0.05$) across all models consistently indicated that the Fixed Effect Model (FEM) is the most efficient and unbiased estimator for this dataset. The FEM approach is superior in this context as it accounts for unobserved heterogeneity and the unique institutional characteristics of the banking and insurance firms listed on the Indonesia Stock Exchange (Hamdouni, 2025; Lolo et al., 2026; Yang & Yang, 2025). By controlling for time-invariant firm-specific factors, this specification mitigates potential endogeneity and omitted variable bias often found in AI adoption studies (Han et al., 2026; Zhang & Piao, 2025). Consequently, the impact of AI adoption is estimated through the following three distinct Fixed Effect models.

1. Model 1: $\text{BOPO}_{it} = \alpha + \beta_1 \text{AI Adoption}_{it} + \beta_2 \text{Firm Size}_{it} + e_{it}$
(Agustiawan, 2024)
2. Model 2: $\text{Z-Score}_{it} = \alpha + \beta_1 \text{AI Adoption}_{it} + \beta_2 \text{Firm Size}_{it} + e_{it}$
(Aldasoro et al., 2025)
3. Model 3: $\text{Tobin's } Q_{it} = \alpha + \beta_1 \text{AI Adoption}_{it} + \beta_2 \text{Firm Size}_{it} + e_{it}$
(Hamdouni, 2025)

In these models, α represents the firm-specific intercepts that capture unobserved, time-invariant characteristics unique to each banking and insurance institution. Firm Size (Z) is incorporated as a critical control variable to account for the influence of institutional scale and resource capacity on technological implementation and financial outcomes (Oldemeyer et al., 2025; Yang & Yang, 2025). By employing this FEM specification, the research ensures that the estimated impact of AI adoption on operational efficiency, financial stability, and market value is robust against heterogeneity bias and individual firm differences throughout the 2020–2024 observation period (Han et al., 2026; Lolo et al., 2026). This methodological approach allows for a more precise analysis of how AI-driven transformations affect performance within the specific regulatory and economic landscape of the Indonesia Stock Exchange

4. Results and Discussion

4.1. Results

The descriptive statistics for all variables utilized in this study, spanning 230 observations from 2020 to 2024, are summarized in Table 1.

Table 1. Descriptive Statistics

Variables	Minimum	Maximum	Mean	Std. Deviation
AI Adoption	0.0000	4.5643	1.5972	1.2991
Operational Efficiency	35.0800	314.1000	91.1384	35.8255
Financial Stability	-0.4423	615.7237	67.3225	89.2888
Firm Value	0.2150	5.3240	1.0096	0.4113
Firm Size	12.3859	21.6100	17.1108	2.2379

The descriptive statistics for the variables, encompassing 230 observations from the Indonesian banking and insurance sectors (2020–2024), are presented in Table 1. The analysis reveals a varied landscape of digital transformation, where AI Adoption Intensity shows a mean value of 1.5972 with a maximum of 4.5643. This indicates that while AI is increasingly integrated into corporate narratives, the adoption remains uneven across the industry, reflecting the "implementation gap" often found in emerging markets (Ayinaddis, 2025; Yuniawan et al., 2025). Firm Size, with a mean of 17.1108 and a relatively low standard deviation (2.2379), confirms that the sample consists of established institutions with the structural scale and capital capacity necessary to navigate the high initial costs of AI-driven infrastructure (Binsar et al., 2026; Oldemeyer et al., 2025).

Regarding performance metrics, Operational Efficiency (BOPO) exhibits a mean of 91.1384, with some firms reaching a maximum of 314.1000, suggesting a high cost-to-income ratio during this observation period. This elevated mean reflects the significant operational expenditures and "token burn" associated with the early stages of high-speed data processing and AI automation (Agustiawan, 2024; Harmelani & Cahyaningtyas, 2024). Furthermore, the Financial Stability (Z-Score) displays substantial volatility (SD = 89.2888), highlighting diverse risk-resilience profiles as firms manage the transition toward AI-driven risk management (Hamdouni, 2025). Meanwhile, the average Firm Value (Tobin's Q) of 1.0096 indicates that the market generally values these firms near their replacement cost, though the maximum value of 5.3240 suggests that certain institutions have successfully signaled their future growth potential through digital innovation to savvy investors (Alshareef, 2025; Koulis et al., 2025). The regression outcomes using the Fixed Effect Model are summarized in Table 2.

Table 2. Regression Results (Fixed Effect Model)

Variable	Model 1 (BOPO)	Model 2 (Z-Score)	Model 3 (Tobin's Q)
AI Adoption (X1)	4.0042	-3.9909	0.0390
Std Error	(2.2718)	(5.7319)	(0.0231)
Prob/Sig (p-value)	[0.0797]*	[0.4871]	[0.0933]*
Firm Size (Z)	-4.4274	0.7727	-0.0136
Std Error	(1.3013)	(3.2832)	(0.0132)
Prob/Sig (p-value)	[0.0008]***	[0.8142]	[0.3062]
F-Statistic (Sig)	0.0036	0.7739	0.2416
LSDV R-Square	0.2238	0.2046	0.1600
Within R-Square	0.0598	0.0028	0.0155

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels

The regression results indicate that AI Adoption has a positive and significant effect on operational efficiency (BOPO) in Model 1, with a coefficient value of 4.0042 and a p-value of 0.0797. In Model 2, AI Adoption shows a negative but insignificant effect on Financial Stability (Z-Score), as reflected by a coefficient of -3.9909 and a p-value of 0.4871. Meanwhile, in Model 3, AI Adoption has a positive and significant effect on Firm Value (Tobin's Q), with a coefficient of 0.0390 and a p-value of 0.0933.

Firm Size, as a control variable, has a negative and significant effect on BOPO, indicating that larger firms tend to operate more efficiently. However, Firm Size does not significantly affect Z-Score and Tobin's Q. The F-statistic results show that only Model 1 is statistically significant overall, while Models 2 and 3 are not significant. In terms of explanatory power, the LSDV R-Square values indicate that the models explain between 16.0% and 22.38% of the variation in the dependent variables, whereas the Within R-Square values suggest relatively limited explanatory power within entities over time.

4.2. Discussion

The analysis of Model 1 reveals a positive and significant relationship between AI Adoption and BOPO. Logically, since a higher BOPO ratio signifies lower efficiency, this finding indicates that increased AI intensity actually drives up operational costs within the Indonesian financial sector. This result confirms the existence of the "Productivity Paradox", where heavy investment in information technology does not immediately translate into bottom-line efficiency (Ayinaddis, 2025).

This phenomenon is likely driven by the high "token burn" costs associated with Large Language Models (LLMs) and high-fidelity AI infrastructure. Firms are currently in a heavy expenditure phase paying for high API subscription fees, specialized cloud computing, and expensive tech talent before the long-term automation benefits can outweigh these costs (Agustiawan, 2024). These results contrast with earlier studies by (Yuniawan et al., 2025), who suggested immediate efficiency gains, but align with the Resource-Based View (RBV), suggesting that while AI is a "valuable" resource, the high cost of acquisition and integration creates a temporary financial burden on operational margins.

Model 2 shows that AI adoption has no statistically significant impact on the Z-Score. This suggests that while firms are actively adopting AI, these technologies have not yet fundamentally altered the solvency or structural risk-resilience of Indonesian banks and insurance companies. This "neutrality" indicates that AI is currently utilized primarily for front-end customer service or marketing rather than being deeply integrated into core risk management or capital allocation frameworks (Hamdouni, 2025; Vuković et al., 2025). The result implies an "Implementation Lag," where the stabilizing effects of AI-driven predictive analytics for credit scoring or fraud detection require more mature datasets and longer integration cycles to significantly move the needle on a firm's overall Z-Score (Hamdouni, 2025).

Interestingly, Model 3 shows a positive and significant impact of AI Adoption on Tobin's Q. This creates a fascinating contradiction: AI increases costs (Model 1), yet it

also increases market value. This aligns perfectly with Signaling Theory, where firms use AI adoption as a signal of modernization and future-readiness to investors. Even if the "token burn" is hurting current profits, the market is willing to pay a premium for institutions that are perceived as digital leaders (Alshareef, 2025). Investors in the Indonesian stock exchange appear to be prioritizing "future growth potential" over "current operational efficiency" in the context of the 2024-2026 AI hype cycle (Koulis et al., 2025).

5. Conclusion

The results confirm that AI's primary impact on the IDX is currently a market signal that enhances valuation. This offers actionable insights for managers to focus on transparent AI disclosures to capture "innovation premiums." Policy makers should encourage digital disclosure to reduce information asymmetry. Future research should explore long-term dynamics and sectoral comparisons to see if the "AI Paradox" resolves into significant efficiency gains over time. Investigating specific AI subsets like machine learning or NLP could provide a more granular understanding of these technological impacts.

The results suggest that AI adoption must be managed with strict cost-benefit oversight to avoid excessive "token burn." For regulators, the lack of impact on stability suggests that AI does not yet pose a systemic risk, but also has not yet provided a safety net for the sector. However, this study is limited by its five-year observation window (2020–2024), which may capture the peak of implementation costs but not the eventual "harvest" period of AI efficiency. Additionally, the study focuses solely on the Indonesian financial sector; results may differ in industries with lower infrastructure barriers.

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